

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

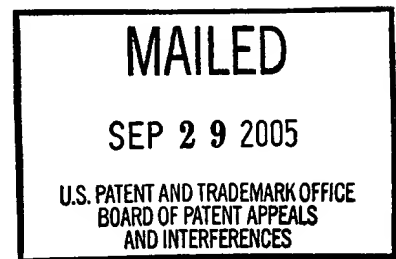
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANIL M. MURCHING, THUMPUDI NAVEEN, and ALI TABATABAI

Appeal No. 2005-2374
Application No. 09/496,068

ON BRIEF



Before KRASS, GROSS, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1, 3-5, and 8.

We affirm.

BACKGROUND

The invention relates to video data processing, and in particular to a method of extracting regions of homogeneous color from a digital picture. Representative claims 1 and 8 are reproduced below.

1. A method of extracting regions of homogeneous color in a digital picture comprising the steps of:

dividing the digital picture into blocks wherein each block comprises a plurality of pixels; and

merging together spatially adjacent blocks that have similar color properties to extract the regions of homogeneous color, wherein the merging step comprises the additional steps of:

extracting a feature vector for each block;

estimate a scalar gradient value for each block as a function of the feature vector, the set of gradient values defining a color gradient field;

digitizing the color gradient field;

preprocessing the digitized color gradient field to produce a smoothed color gradient field; and segmenting the smoothed color gradient field with a watershed algorithm that divides the smoothed color gradient field into a set of spatially connected regions of homogeneous color.

8. A method for representing spatial relationships between regions of homogeneous color in a digital picture producing data suitable for use in an image database application comprising the steps of:

dividing the digital picture into blocks;

estimating a scalar gradient value for each block by defining a color gradient field corresponding to each block;

representing said data corresponding to the digital picture as a probability distribution function calculated in view of blocks of the digital picture that are homogenous in color and distances between the blocks that are homogenous in color.

The examiner relies on the following references:

Oddou	5,577,131	Nov. 19, 1996
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Leila Shafarenko et al. (Shafarenko), Automatic Watershed Segmentation of Randomly Textured Color Images, IEEE Transactions on Image Processing, Vol. 6, No. 11, pp. 1530-44, Nov. 1997.

J. M. Corridoni et al. (Corridoni), Pyramidal Retrieval by Color Perceptive Regions, Proceedings of IEEE Int'l Workshop on Content-Based Access of Image and Video Database, pp. 2-11, Jan. 1998.¹

Demin Wang (Wang), Unsupervised Video Segmentation Based on Watersheds and Temporal Tracking, IEEE Transactions on Circuits and Systems for Video Technology, Vol. 8, No. 5, pp. 539-46, Sep. 1998.

Jiebo Luo et al. (Luo), Incorporation of Derivative Priors in Adaptive Bayesian Color Image Segmentation, Proceedings of the Int'l Conference on Image Processing, vol. 3, pp. 780-84, Oct. 1998.²

Claims 1 and 3-5 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shafarenko, Wang, and Oddou.

Claim 8 stands rejected under 35 U.S.C. § 103 as being unpatentable over Luo and Corridoni.

¹ We take the citation from the Examiner's Answer, but the file copy of the reference is an apparent reprint of an IEEE paginated journal, pages 205 through 211, copyright 1997.

² We take the citation from the Examiner's Answer, but the file copy of the reference is an apparent reprint of an IEEE paginated journal, copyright 1998.

The examiner has indicated claim 6 to be allowed. Claims 2 and 7 have been canceled.

We refer to the Rejection (mailed Jan. 16, 2004) and the Examiner's Answer (mailed Dec. 27, 2004) for a statement of the examiner's position and to the Brief³ (filed Jun. 9, 2005) for appellants' position with respect to the claims which stand rejected.

OPINION

We select instant claims 1 and 8 as representative in this appeal, consistent with appellants' arguments in the Brief. See 37 CFR § 41.37(c)(1)(vii) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)).

The examiner submits the combination of Shafarenko and Wang to show prima facie obviousness of the subject matter of claim 1. The examiner admits that the combination does not teach dividing the digital picture into blocks "wherein each block comprises a plurality of pixels." The examiner turns to Oddou for the teaching of dividing an image to be segmented into macroblocks, and notes that the resolution of the image is reduced but computation is facilitated. (Answer at 4-5.)

³ The Brief is a substitute for earlier papers that we have not considered in reaching our determinations infra.

Appellants argue that Shafarenko “teaches away” from the proposed combination. According to appellants, Shafarenko teaches that block segmentation would result in missing certain color variations at the pixel level. The stated basis for the view relates to Shafarenko, in the introduction, teaching how if “size-based filters” are used to filter out insignificant features, then “small but significant features in terms of color saliency may be removed.” Appellants also submit that Oddou “teaches away” because in that reference texture, rather than color, is segmented. (Brief at 3-4.)

The examiner responds that the Shafarenko passage recognizes a trade-off associated with filtering an image to be segmented; i.e., small but significant features in terms of color saliency “may” be removed. According to the examiner, Shafarenko merely recognizes there are pros and cons associated with filtering an image before segmentation but does not preclude the proposed combination. Further, the examiner submits that the only teaching relied upon in Oddou is that, when performing watershed segmentation on a textured image, the segmentation process may be advantageously effected on the basis of blocks of pixels rather than individual pixels. The more general teaching of Oddou is that blocks of pixels are generated, and then features are extracted from the block, consistent with the instant claimed subject matter. (Answer at 9-10.)

“A reference may be said to teach away when a person of ordinary skill, upon [examining] the reference, would be discouraged from following the path set out in the

reference, or would be led in a direction divergent from the path that was taken by the applicant.” Para-Ordnance Mfg. v. SGS Importers Int’l, 73 F.3d 1085, 1090, 37 USPQ2d 1237, 1241 (Fed. Cir. 1995) (quoting In re Gurley, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994)). Appellants have not identified where Shafarenko might warn the artisan against dividing the digital picture into blocks, wherein each block comprises a plurality of pixels. Nor have appellants shown where Oddou might warn the artisan against segmentation with respect to color.

At best, appellants have shown that Shafarenko recognizes that, in a typical granite image, small but significant features in terms of color saliency might be removed if one were to try to filter out insignificant features that may not be perceived as significant to the human eye. In the combination that is applied, the teaching may be weighed against the known benefits of compression of images for processing and storage (e.g., Oddou at col. 1, ll. 5-30), which, as the examiner notes, does not necessarily require blocks (“macropixels”) as large as 16x16 pixels. Moreover, Shafarenko expressly teaches that the process is not limited to granite images (e.g., Shafarenko at 1542, 1st and 2nd full paragraphs).

What a reference teaches is a question of fact. In re Baird, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994); In re Beattie, 974 F.2d 1309, 1311, 24 USPQ2d 1040, 1041 (Fed. Cir. 1992). Appellants’ arguments do not persuade us of error in the examiner’s findings underlying the conclusion of prima facie unpatentability. We

sustain the rejection of claims 1 and 3-5 under 35 U.S.C. § 103 as being unpatentable over Shafarenko, Wang, and Oddou.

The statutory basis for the rejection of claim 8 is nominally 35 U.S.C. § 103, but the rejection could also be considered as a finding of anticipation under § 102.⁴ In any event, the examiner's stated rationale for the rejection is clear. The examiner submits that all of claim 8 is met by the teachings of Luo, except for the recognition of the data being suitable for use in an image database application. Corridoni is submitted as teaching that the color segmentation of an image provides data that is suitable for use in an image database application. (Answer at 7-8.) The examiner also provides the reasoning that the reference to show inherency (Corridoni) is not necessary, because the claim 8 recitation regarding "suitability" represents mere intended use. (Answer at 10-11.)

Appellants argue that Corridoni "teaches away" from the invention because the reference is concerned with the operation of regions where distances are minimal. (Brief at 4-5.)

The preamble of a claim does not limit the scope of the claim when it merely states a purpose or intended use of the invention. In re Paulsen, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994). We agree with the examiner that the

⁴ A claim that is anticipated by a reference is also obvious under 35 U.S.C. § 103, since "anticipation is the epitome of obviousness." See, e.g., Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); In re Fracalossi, 681 F.2d 792, 794, 215 USPQ 569, 571 (CCPA 1982); In re Pearson, 494 F.2d 1399, 1402, 181 USPQ 641, 644 (CCPA 1974).

preamble language of the data being “suitable for use in an image database application” appears to represent mere intended use for the steps recited in claim 8, and thus not a limitation of the claim.

Even assuming the language limits the scope of the claim, appellants have not shown error in the examiner’s finding of inherency with respect to Luo. In particular, the rejection is not based on, and does not contemplate, replacing any data generated by Luo with any data generated by Corridoni. Corridoni is merely used to show what the artisan would understand when considering the Luo reference, even though the material is not express in Luo. The inherent teaching of a prior art reference arises both in the context of anticipation and obviousness. In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (citing In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983)). When a reference is silent about an asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

We thus sustain the rejection of claim 8 under 35 U.S.C. § 103 as being unpatentable over Luo and Corridoni.

CONCLUSION

The rejection of claims 1, 3-5, and 8 under 35 U.S.C. § 103 is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a). See 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

Carl M. Klein

ERROL A. KRASS
Administrative Patent Judge

Anta Pellman Gross

ANITA PELLMAN GROSS
Administrative Patent Judge

Howard S. Blankenship

HOWARD B. BLANKENSHIP
Administrative Patent Judge

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